WHAT IS CLAIMED IS:

1. An optical transceiver comprising:

a transmitting side path including:

an input interface for inputting an electric signal;

a multiplexing circuit for time-multiplexing the inputted electric signal; and

an electricity-light converter for converting the time-multiplexed electric signal into a light signal; and

a receiving side path including:

a light-electricity converter for converting an inputted light signal into an electric signal;

a demultiplexing circuit for demultiplexing the converted electric signal; and

an output interface for outputting the demultiplexed electric signal;

wherein, in the transmitting side path, said optical transceiver comprises:

a first pseudo-random pattern generator for generating a pseudo-random pattern signal, and for outputting the pseudo-random pattern signal to the multiplexing circuit; and

a first pseudo-random pattern detector for evaluating the pseudo-random pattern signal, which has been inputted to the transmitting side path through the input interface;

in the receiving side path, said optical transceiver comprises:

a second pseudo-random pattern generator for generating a pseudo-random pattern signal, and for outputting the pseudo-random pattern signal to the output interface; and

a second pseudo-random pattern detector for evaluating the pseudo-random pattern signal, which has been inputted to the receiving side path through the demultiplexing circuit; and

said optical transceiver further comprising:

a first loopback path that transmits the pseudo-random pattern signal from the multiplexing circuit of the transmitting side path to the demultiplexing circuit of the receiving side path; and

a second loopback path that transmits the pseudo-random pattern signal from the light-electricity converter of the receiving side path to the electricity-light converter of the transmitting side path.

2. An optical transceiver according to claim 1, further comprising:

in the transmitting side path, a first selector that selects an electric signal from the input interface or a pseudo-random pattern signal from the first pseudo-random pattern generator, and that outputs the electric signal or the pseudo-random pattern signal to the first pseudo-random pattern detector; and

in the receiving side path, a second selector that selects an electric signal from the demultiplexing circuit or a pseudo-random pattern signal from the second pseudo-

random pattern generator, and that outputs the electric signal or the pseudo-random pattern signal to the second pseudo-random pattern detector.

3. An optical transceiver according to claim 1, further comprising:

in the transmitting side path, a first selector that selects an electric signal from the input interface or a pseudo-random pattern signal from the first pseudo-random pattern generator; and

a third selector that selects an electric signal from the input interface or an output of the first selector, and that outputs the electric signal or the output of the first selector to the first pseudo-random pattern detector; and

in the receiving side path, a second selector that selects an electric signal from the demultiplexing circuit or a pseudo-random pattern signal from the second pseudo-random pattern generator; and

a fourth selector that selects an electric signal from the demultiplexing circuit or an output of the second selector, and that outputs the electric signal or the output of the second selector to the second pseudo-random pattern detector.

4. An optical transceiver according to claim 1, wherein:

a first integral pseudo-random pattern generator/detector is configured as one circuit comprising

the first pseudo-random pattern generator and the first pseudo-random pattern detector; and

a second integral pseudo-random pattern generator/detector is configured as one circuit comprising the second pseudo-random pattern generator and the second pseudo-random pattern detector.

5. An optical transceiver according to claim 4, wherein:

the first and the second integral pseudo-random pattern generators/detectors input a pseudo-random pattern signal, which has been inputted, as an initial value to generate a pseudo-random pattern signal for error detection and comparison;

pseudo-random pattern detection is performed by comparing the generated pseudo-random pattern signal for error detection and comparison with the inputted pseudo-random pattern signal; and

pseudo-random pattern generation is performed by generating a pseudo-random pattern signal using a given initialization signal, or by generating the pseudo-random pattern signal by inputting the inputted pseudo-random pattern signal as an initial value.

6. An optical transceiver according to claim 1, wherein:

the input interface, the first pseudo-random pattern generator, the first pseudo-random pattern detector, and the multiplexing circuit are integrated into a multiplexing

integrated circuit; and

the demultiplexing circuit, the second pseudo-random pattern generator, the second pseudo-random pattern detector, and the output interface are integrated into a demultiplexing integrated circuit.

7. An optical transceiver according to claim 1, wherein:

the input interface, the first pseudo-random pattern generator, the first pseudo-random pattern detector, the multiplexing circuit, the demultiplexing circuit, the second pseudo-random pattern generator, the second pseudo-random pattern detector, the output interface, and the first loopback path are integrated into one unit to constitute an integral multiplexing/demultiplexing integrated circuit.

8. A multiplexing integrated circuit comprising:

an input interface for inputting an electric signal;

a multiplexing circuit for time-multiplexing the inputted electric signal;

a pseudo-random pattern generator for generating a pseudo-random pattern signal, and for outputting the pseudo-random pattern signal to the multiplexing circuit; and

a pseudo-random pattern detector for evaluating the pseudo-random pattern signal, which has been inputted through the input interface.

9. A multiplexing integrated circuit according to

claim 8, wherein:

an integral pseudo-random pattern generator/detector is configured as one circuit comprising the pseudo-random pattern generator and the pseudo-random pattern detector.

10. A demultiplexing integrated circuit comprising:

a demultiplexing circuit for demultiplexing an inputted electric signal;

an output interface for outputting the demultiplexed electric signal;

a pseudo-random pattern generator for generating a pseudo-random pattern signal, and for outputting the pseudo-random pattern signal to the output interface; and

a pseudo-random pattern detector for evaluating the pseudo-random pattern signal, which has been inputted through the demultiplexing circuit.

11. A demultiplexing integrated circuit according to claim 10, wherein:

an integral pseudo-random pattern generator/detector is configured as one circuit comprising the pseudo-random pattern generator and the pseudo-random pattern detector.

12. An integral multiplexing/demultiplexing integrated circuit comprising:

a multiplexing portion including:

an input interface for inputting an electric signal;

a multiplexing circuit for time-multiplexing

the inputted electric signal;

a first pseudo-random pattern generator for generating a pseudo-random pattern signal, and for outputting the pseudo-random pattern signal to the multiplexing circuit; and

a first pseudo-random pattern detector for evaluating the pseudo-random pattern signal, which has been inputted through the input interface;

a demultiplexing portion including:

a demultiplexing circuit for demultiplexing the inputted electric signal;

an output interface for outputting the demultiplexed electric signal;

a second pseudo-random pattern generator for generating a pseudo-random pattern signal, and for outputting the pseudo-random pattern signal to the output interface; and

a second pseudo-random pattern detector for evaluating the pseudo-random pattern signal, which has been inputted through the demultiplexing circuit; and

a loopback path that transmits the pseudo-random pattern signal from the multiplexing circuit to the demultiplexing circuit.

13. An integral multiplexing/demultiplexing integrated circuit according to claim 12, wherein:

a first integral pseudo-random pattern generator/detector is configured as one circuit comprising the first pseudo-random pattern generator and the first

pseudo-random pattern detector; and

a second integral pseudo-random pattern generator/detector is configured as one circuit comprising the second pseudo-random pattern generator and the second pseudo-random pattern detector.

14. A method for evaluating and testing an optical transceiver, said optical transceiver comprising:

a transmitting side path including:

an input interface for inputting an electric signal;

a first pseudo-random pattern generator for generating a pseudo-random pattern signal;

a first pseudo-random pattern detector for evaluating the pseudo-random pattern signal, which has been inputted through the input interface;

a multiplexing circuit for time-multiplexing the inputted electric signal;

an electricity-light converter for converting the time-multiplexed electric signal into a light signal;

a receiving side path including:

a light-electricity converter for converting an inputted light signal into an electric signal;

a demultiplexing circuit for demultiplexing the converted electric signal; and

a second pseudo-random pattern generator for generating a pseudo-random pattern signal;

a second pseudo-random pattern detector for evaluating the pseudo-random pattern signal, which has been

inputted through the demultiplexing circuit; and

an output interface for outputting the demultiplexed electric signal;

a first loopback path that transmits the pseudo-random pattern signal from the multiplexing circuit of the transmitting side path to the demultiplexing circuit of the receiving side path; and

a second loopback path that transmits the pseudo-random pattern signal from the light-electricity converter of the receiving side path to the electricity-light converter of the transmitting side path;

wherein:

the optical transceiver is placed on an implementation substrate;

a loopback electric wiring is placed on the implementation substrate so that said loopback electric wiring loops back from an output electric wiring on the implementation substrate, which is connected to the output interface, to an input electric wiring on the implementation substrate, which is connected to the input interface;

an output of the electricity-light converter is connected to an outside pseudo-random pattern detecting function through a first optical fiber; and

an input of a light-electricity converter is connected to an outside pseudo-random pattern generating function through a second optical fiber.

15. A method for evaluating and testing an optical

transceiver according to claim 14, wherein a light measuring instrument is used as the outside pseudo-random pattern detecting function and the outside pseudo-random pattern generating function.

16. A method for evaluating and testing an optical transceiver according to claim 14, wherein another optical transceiver, which works normally, is used as the outside pseudo-random pattern detecting function and the outside pseudo-random pattern generating function.

17. A method for evaluating and testing an optical transceiver, said optical transceiver comprising:

a transmitting side path including:

an input interface for inputting an electric signal;

a first pseudo-random pattern generator for generating a pseudo-random pattern signal;

a first pseudo-random pattern detector for evaluating the pseudo-random pattern signal, which has been inputted through the input interface;

a multiplexing circuit for time-multiplexing the inputted electric signal; and

an electricity-light converter for converting the time-multiplexed electric signal into a light signal;

a receiving side path comprising:

a light-electricity converter for converting an inputted light signal into an electric signal;

a demultiplexing circuit for demultiplexing the

converted electric signal;

a second pseudo-random pattern generator for generating a pseudo-random pattern signal;

a second pseudo-random pattern detector for evaluating the pseudo-random pattern signal, which has been inputted through the demultiplexing circuit; and

an output interface for outputting the demultiplexed electric signal; and

a loopback path that transmits the pseudo-random pattern signal from the multiplexing circuit of the transmitting side path to the demultiplexing circuit of the receiving side path;

wherein:

the optical transceiver is placed on an implementation substrate;

a loopback electric wiring is placed on the implementation substrate so as to loop back from an output electric wiring on the implementation substrate, which is connected to the output interface, to an input electric wiring on the implementation substrate, which is connected to the input interface;

a loopback optical fiber, which is used for transmitting the pseudo-random pattern signal from a first optical fiber connected to an output of the electricity-light converter to a second optical fiber connected to an input of the light-electricity converter, is connected;

the input electric wiring on the implementation substrate is connected to an outside pseudo-random pattern generating function; and

the output electric wiring on the implementation substrate is connected to an outside pseudo-random pattern detecting function.

18. A method for evaluating and testing an optical transceiver according to claim 17, wherein an electric measuring instrument is used as the outside pseudo-random pattern detecting function and the outside pseudo-random pattern generating function.

19. A method for evaluating and testing an optical transceiver according to claim 17, wherein another optical transceiver, which works normally, is used as the outside pseudo-random pattern detecting function and the outside pseudo-random pattern generating function.

20. A method for evaluating and testing an optical transceiver, said optical transceiver comprising:

a transmitting side path including:

an input interface for inputting an electric signal;

a first pseudo-random pattern generator for generating a pseudo-random pattern signal;

a first pseudo-random pattern detector for evaluating the pseudo-random pattern signal, which has been inputted through the input interface;

a multiplexing circuit for time-multiplexing the inputted electric signal; and

an electricity-light converter for converting

the time-multiplexed electric signal into a light signal;

a receiving side path including:

a light-electricity converter for converting an inputted light signal into an electric signal;

a demultiplexing circuit for demultiplexing the converted electric signal; and

a second pseudo-random pattern generator for generating a pseudo-random pattern signal;

a second pseudo-random pattern detector for evaluating the pseudo-random pattern signal, which has been inputted through the demultiplexing circuit; and

an output interface for outputting the demultiplexed electric signal; and

a loopback path that transmits the pseudo-random pattern signal from the multiplexing circuit of the transmitting side path to the demultiplexing circuit of the receiving side path;

wherein:

the optical transceiver is placed on an implementation substrate;

a loopback electric wiring is placed on the implementation substrate so as to loop back from an output electric wiring on the implementation substrate, which is connected to the output interface, to an input electric wiring on the implementation substrate, which is connected to the input interface; and

a loopback optical fiber, which is used for transmitting the pseudo-random pattern signal from a first optical fiber connected to an output of the electricity-

light converter to a second optical fiber connected to an input of the light-electricity converter, is connected.

21. A method for evaluating and testing an optical transceiver according to claim 20, wherein:

a pseudo-random pattern generating function of a framer circuit, which generates and transmits/receives a frame pattern, is connected to the input electric wiring; and

a pseudo-random pattern detecting function of the framer circuit is connected to the output electric wiring.

22. A method for evaluating and testing an optical transceiver according to claim 21, wherein the framer circuit builds a pseudo-random pattern signal into a frame pattern to transmit the pseudo-random pattern signal.